

An Overview of Empirical Research on Domain-Specific Grit in L2 Learning Contexts



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Abstract: The recent emergence of Positive Psychology within the field of second language (L2) acquisition has sparked scholarly interest in examining L2 learners' psychological factors, including their achievement emotions and personality traits, that can significantly influence the language learning process. In particular, L2 grit, a positive personality trait central to the learning process, has received considerable attention. In this context, this study seeks to present an up-to-date overview of the empirical studies addressing L2 grit indexed in the Web of Science database. During the course of the study, comprehensive analyses were conducted on the overall trend of this field, the research subjects, research methods, and key research themes prevalent in empirical studies related to L2 grit, with the goal of identifying trends and existing knowledge gaps within the field. This study has yielded several significant findings. First and foremost, it is anticipated that the realm of L2 grit will undergo an upward trajectory. Additionally, the results indicated a notable diversity in study subjects, given their academic status and cultural backgrounds. Moreover, it is also discerned that quantitative research methodologies were predominantly employed in this area of inquiry. Furthermore, the principal themes examined in the reviewed studies encompass scale development and validation, the impact of L2 grit on academic performance, the dynamic change of L2 grit over time, and the interplay between L2 grit and learner-internal and learner-external factors. This review article culminates in a critical discussion of the constraints of existing studies and finally suggests potential avenues for future research.

Keywords: L2 Grit; Scale Development and Validation; Language Performance; Dynamic Change; Learner-internal Variables; Learner-external Variables

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1 Introduction

The advent of Positive Psychology (PP) has heralded a gradual shift in directions within the realm of psychological inquiry (Rivera et al., 2024) [1]. PP is a novel paradigm within psychology, leveraging sophisticated measurement and experimental methods to investigate individuals' strengths, virtues, positive emotions, and other positive aspects (Sheldon & King, 2001) [2]. Initially proposed by Seligman (1998) [3], PP has been progressively incorporated into various domains such as education, extending from a focus on negative emotions to pos-

itive ones and from deficiencies to strengths in personality traits.

As PP-related theories evolve and mature, researchers have devoted increasing attention to the influence of positive personality traits on individual learning (e.g., Chamorro-Premuzic & Furnham, 2009; Hong et al., 2023) [4, 5]. Among these traits is grit, which has been described as the ability to persevere through hardships to meet goals (Stoffel & Cain, 2018) [6]. As research continues, it becomes apparent that grit extends beyond per-

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severance to encompass a deeper sense of long-term interests and enthusiasm. Duckworth (2007) [7] was an early pioneer in this field, introducing the concept of grit as a fusion of personal passion and long-term goal perseverance. Reflecting on the essence of grit, Duckworth (2007) [7] proposed that grit is a two-factor construct comprising an individual's unwavering commitment towards long-term goals and enduring passion. The former is indicative of the individual's sustained energy investment in long-term tasks, even in the face of adversity, while the latter reflects the individual's steadfast and focused passion for lofty goals. Some scholars have also contextualized grit within the educational settings, attributing social significance to it by viewing it as a social and emotional competence rather than a personality trait (O'Neal *et al.*, 2019) [8].

The surge of scholarly interest in language learners' grit personality, driven by the dynamic integration of psychology and language learning, has prompted numerous studies to explore the concept of L2 grit. Drawing on Duckworth *et al.*'s (2007) [7] definition of grit, researchers have focused on understanding L2 grit as encompassing perseverance of effort (POE) and consistency of interest (COI) in second language learning (Gyamfi & Lai 2020; Teimouri *et al.* 2020) [9, 10]. It is suggested that examining L2 grit not only contributes to furthering the theory of grit within specific domains (Sudina *et al.*, 2021a) [11], but also enriches the research on positive personality traits in the context of language learning (Wei *et al.* 2020) [12]. In this context, this review article aims to provide a comprehensive and structured overview of the existing research related to L2 grit, and to clarify the research trends and highlight future areas for exploration within this field.

2 Data Collection and Screening

This study conducted a comprehensive review of literature pertaining to L2 learners' grit personality. We performed a literature search through the English database Web of Science Core Collection using "L2 grit" and "language learning" as the search terms. The initial search yielded a total of 159 research articles, inclusive of all publication dates (as of March 8 2024). Following the initial search, the authors independently and manually reviewed the titles and abstracts of each article, excluding review articles and studies related to L2 teacher grit and domain-general grit. This thorough screening process

yielded a final count of 93 empirical studies, specifically related to L2 learners' grit. Based on these 93 studies, the authors analyzed the research tools, methods, participants, and themes prevalent within the L2 grit literature. Both authors independently coded each article in these respects, achieving an overall level of agreement of 95.70%. Any discrepancies were promptly addressed through consensus discussion.

3 Results

3.1 Overall Trend

The results of the literature retrieval revealed that 93 articles indexed in the Web of Science Core Collection were published from 2018 to 2024. From 2018 (4 articles) to 2023 (36 articles), the number of empirical articles related to L2 learners' grit personality generally showed an upward trend (see Figure 1). As of March 8, 2024, 11 new studies have been published within the current year. In line with the overall trend in the publication volume, it is anticipated that the number of publications will hit a peak during the remainder of 2024.

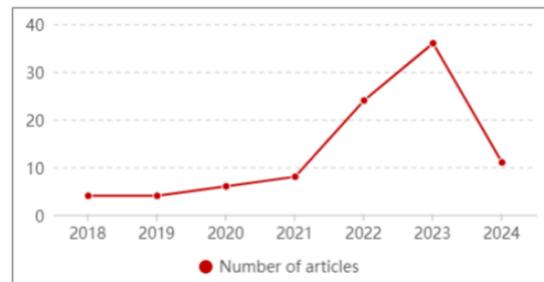


Figure 1 Number of publications from 2018 to 2024

3.2 Research Methodology

3.2.1 Sampling

The selection of subjects in the reviewed studies exhibited substantial variations across different populations and sample sizes. Specifically, 60 studies focused exclusively on college students, 13 studies targeted high school students, and 4 studies examined elementary school students. Additionally, 5 studies included a mixed group of participants, combining both high school and college students. However, in 11 studies, it was not explicitly stated whether the participants were from elementary, secondary, or tertiary schools. From a linguistic perspective, the majority of the studies (N=87) centered around English as a

foreign language (EFL) or English as a second language (ESL) learners, such as those conducted by Wang and Ren (2023) [13] and Wang et al. (2021) [14]. In contrast, 4 studies concentrated on Chinese language learners, like the research by Zhao et al. (2023) [15], while 1 study focused on German learners in the Chinese mainland (Li & Yang, 2023) [16]. Moreover, there was a study on Spanish and French language learners (Sudina & Plonsky, 2023) [17]. Regarding the geographic origins of the study participants, 29 studies recruited their participants from the Chinese mainland, while 26 studies focused on EFL learners in Iran. The remaining studies drew participants from various countries or regions, including South Korea (N=4), Taiwan (N=4), the United States (N=4), Saudi Arabia (N=4), Turkey (N=3), Hong Kong SAR (N=2), Indonesia (N=2), Japan (N=2), Spain (N=2), Ethiopia (N=1), Iraq (N=1), Kuwait (N=1), Norway (N=1), Poland (N=1), and Russia (N=1). Five studies explored cross-cultural groups, such as the study by Yang et al. (2022) [18] which included participants from the Chinese mainland and Iran, and Sudina et al. (2021b) [19] which involved 104 ESL learners from Canada, Japan, South Korea, and the United States, as well as 350 EFL learners. In terms of sample sizes, the studies varied significantly, ranging from 30 to 3272 participants. Studies with smaller sample sizes tended to utilize quasi-experimental designs, with an experimental and control group to assess the impact of teaching interventions. Conversely, studies with larger sample sizes often used quantitative surveys to collect extensive data efficiently.

3.2.2 Language Learning Contexts

The reviewed research has been conducted in various learning contexts. Specifically, 79 studies have zoomed in on traditional offline classroom settings (e.g., Wang & Ren, 2024; Li & Yang, 2023) [13, 16]. Additionally, 14 studies have investigated non-traditional teaching environments, such as purely online language courses, the use of learning software for digital learning, or a blend of online and offline learning. For example, Derakhshan and Fathi (2023) [20] explored the relationship among foreign language enjoyment (FLE), L2 grit, online learning self-efficacy, and online learning engagement among Iranian English learners. Similarly, Liu et al. (2021) [21] examined the interplay between self-oriented learning perfectionism, English learning burnout, learning anxiety, and L2 grit among university students in the Chinese mainland who utilized mobile applications for English

learning. Furthermore, Paradowski and Jelińska (2023) [22] investigated the connections among L2 grit, learning motivation, self-directed learning, autonomy, curiosity, and language mindsets among 615 English learners from 69 countries participating in online distance learning or hybrid instruction.

3.2.3 Research Methods and Instruments

The majority of the reviewed studies (N=83) have utilized a quantitative research approach to examine the correlation between L2 grit and various other factors. Primarily, data was gathered through Likert-type questionnaires completed by participants, which assessed related constructs such as The Foreign Language Enjoyment Scale (Li et al., 2018) [23], The L2 Grit Scale (Teimouri et al., 2020) [10], and The Language Learning Anxiety Scale (Dewaele & MacIntyre, 2014) [24], among others. Moreover, studies exploring the association between language performance and other variables obtained participants' self-reported language proficiency, Grade Point Average (GPA), scores on final examinations, or performance on standardized tests.

In the quantitative research analyzed, various statistical approaches were utilized based on the research questions. To validate measurement scales, confirmatory factor analyses (CFA) or reliability tests were commonly conducted, with some studies also constructing structural equation models (SEM) to demonstrate the relationships between variables (e.g. Teimouri et al., 2020; Fathi et al., 2024) [10, 25]. In a longitudinal context, a few studies explored L2 grit and its co-development with other constructs using factor curve models (FCM) or latent growth curve models (e.g., Hejazi & Sadoughi, 2023; Shirvan et al., 2021) [26, 27]. Furthermore, regression analyses were employed by certain studies to illustrate predictive relationships among variables (e.g., Choi & Lee, 2023; Pawlak et al., 2022) [28, 29]. The majority of these studies took a variable-centered approach while a small subset adopted a person-centered approach to investigate potential relationships between various grit profiles and L2 learning outcomes (e.g., Khodaverdian Dehkordi et al., 2021; Lee & Xie, 2023) [30, 31].

Seven works adopted a quasi-experiment design and compared the outcomes of the control and experimental groups after the teaching treatment. In this line of research, independent-samples *t* test, paired-samples *t* test, one-way ANOVA (Analysis of Variance), one-way ANCOVA (Analysis of Covariance), or one-way MANOVA (Multi-

variate Analysis of Variance) were also utilized to assess the effectiveness of the teaching intervention or treatment (e.g., Pawlak *et al.*, 2022; Ghafouri, 2024; Wang, 2024) [29, 32, 33]. On the other hand, the remaining three studies employed a mixed research approach, combining qualitative and quantitative data to address their research questions (e.g., Lee & Taylor, 2022; Chen Hsieh & Lee, 2023) [34, 35]. For example, Lee and Taylor (2022) [34] employed a combination of quantitative questionnaire surveys and semi-structured interviews to explore the relationships between positive psychology variables (including L2 grit), willingness to communicate (WTC), and hours spent on extramural English learning among pupils in Hong Kong SAR. Similarly, Chen Hsieh and Lee (2023) [35] required participants to maintain reflective journals and complete quantitative scales to examine the connections between digital storytelling outcomes, affect, grit, and perceptions of the learning experience among EFL middle school learners in Taiwan.

3.3 Major Strands

The comprehensive examination of the 93 research articles explicitly highlights the presence of five significant themes associated with L2 grit, these themes encompass: (1) the development and validation of L2 grit scales; (2) the influence of L2 grit on academic performance; (3) the change of L2 grit over time; (4) the interplay between L2 grit and other learner-internal variables; (5) the nexus between L2 grit and learner-external factors. Subsequently, representative studies pertinent to each of these themes are reviewed.

3.3.1 Scale Development and Validation

L2 grit is a latent variable and therefore cannot be directly observed. Therefore, it is necessary to operationalize this construct into observable variables for its measurement. To address this issue, scholars have attempted to develop measurement tools that can accurately and reliably evaluate learners' L2 grit. For example, Ebadi *et al.* (2018) [36] designed a grit instrument tailored to the Iranian EFL context. Their scale was structured into four dimensions, encompassing elements such as trying hard to learn English, having interest in learning English, practicing a lot in order to learn English, and having goals for learning English. Despite its potential value, the scale has not been extensively utilized in L2 research.

In another study, Teimouri *et al.* (2020) [10] elaborated

on Duckworth *et al.*'s (2007) [7] theoretical framework of grit, specifically examining the existence of two distinct dimensions within the construct of L2 grit, namely, POE and COI in language learning. Utilizing an exploratory factor analysis (EFA) and CFA, the authors determined that these dimensions were indeed present. With these dimensions in mind, they developed an L2 grit scale. This two-factorial scale has since been validated in a variety of contexts, including research with EFL learners (Wei *et al.*, 2020) [12] and German-as-a-foreign-language (GFL) learners (Li & Yang, 2023) [16] in China, EFL learners in Japan (Mikami, 2023) [37], Iran (Shirvan *et al.*, 2022) [38], and Saudi Arabia (Alamer, 2021) [39] and other countries. These studies, predominantly cross-sectional, employed the L2 grit scale to explore the relationship between learners' grit personality and language learning outcomes, as well as other related psychological or non-psychological constructs. Notably, Shirvan *et al.* (2022) [38] and Cui and Yang (2022) [40] adopted a longitudinal design, allowing for the evaluation of the scale's validity over time. Their results indicated that the fit indices of the measurement models were satisfactory and that the latent factor of L2 grit remained invariant across time.

3.3.2 Impact of L2 Grit on Academic Performance

The second significant area of inquiry into L2 grit has primarily revolved around its impact on L2 learners' linguistic performance. Numerous studies have revealed that individuals demonstrating higher levels of grit tend to achieve superior language outcomes (e.g., Wang & Ren, 2024; Zhao *et al.*, 2023; Li & Yang, 2023; Choi & Lee, 2023; Wang, 2024; Calafato, 2024; Shehzad *et al.*, 2022; Teimouri *et al.*, 2022;) [13, 15-16, 28, 33, 41-43]. For example, Wang (2024) [33] utilized a quasi-experimental design to investigate the influences of self-evaluation, teacher support, and L2 grit on the grammatical improvement of EFL learners in the Chinese mainland. Participants were divided into a control group receiving regular education and an experimental group receiving additional instruction in self-evaluation and L2 grit. The results revealed that the experimental group displayed a greater success rate in grammar evaluation compared to the control group. Wang and Ren (2024) [13] found that POE, rather than COI, significantly predicted EFL learners' pragmatic comprehension. Calafato (2024) [41] discovered that POE positively influenced both reading and

writing achievement, while COI only positively influenced writing achievement. Teimouri et al. (2022) [43] found that L2 grit exhibited positive effects in predicting language achievement measures (grades in grammar, speaking, and listening courses, GPAs, and self-reported English language proficiency). Shehzad et al. (2022) [42] detected a significant positive correlation between both components of L2 grit (i.e., POE and COI) and learners' English pronunciation performance. Collectively, most of these studies have unanimously highlighted the role of POE as a more robust predictor of language performance than COI. However, a single study conducted by Choi and Lee (2023) [28] in the Korean EFL context indicated a contrasting finding that participants' vocabulary knowledge exhibited a significant positive correlation with COI rather than POE. As such, future research should investigate and compare the effects of the sub-components of L2 grit on diverse linguistic skills.

In addition to the existing literature concerning L2 grit in EFL contexts, Li and Yang (2023) [16] further examined the role of L2 grit within the GFL setting. Their findings revealed a positive correlation between learners' grit levels and their German proficiency. Furthermore, Zhao et al. (2023) [15] explored the association between the Arabic Chinese learners' grit levels and their Chinese learning outcomes. Their study underscored the positive relationship between learners' grit and their Chinese language learning success.

3.3.3 Dynamic Change of L2 Grit over Time

In the realm of L2 studies, grit personality is commonly understood to encompass two key components: persistent effort and consistent enthusiasm (Teimouri et al., 2020) [10], reflecting a long-term orientation. Despite this, much of the existing research on L2 grit has tended to rely on cross-sectional designs, lacking a longitudinal focus on how the grit personality evolves in language learners. An exception to this trend is the work of Shirvan et al. (2021) [27], who conducted four questionnaire surveys with 437 EFL learners in Iran at two-week intervals. Their findings revealed that levels of L2 grit were higher in the growth stage compared to the initial stage, indicating a notable advancement in learners' grit over time. Building on this, Shirvan et al. (2022) [38] followed a similar methodology with the same group of Iranian EFL learners and discovered that those with higher initial levels of L2 grit exhibited lower fluctuations in subsequent surveys, while individuals with lower initial levels saw a gradual increase in

their grit levels over time. This suggests that the development of grit personality is a gradual process that learners shape throughout their learning journey, rather than an instantaneous occurrence. Consequently, there is a need for more extensive research to delve into the dynamic shifts in L2 grit over time and to explore variations in individuals' responses.

3.3.4 Grit and Learner-internal Variables

A large proportion of research related to L2 grit has focused on its associations with various learner-internal variables, notably learners' emotional states, language mindsets, and motivational variables.

(1) *Grit and Academic Emotions*

The positive psychology perspective commonly explores the constructs of foreign language enjoyment (FLE) and L2 self-efficacy in conjunction with L2 grit. Studies in diverse language teaching contexts consistently indicate that students who derive more joy from language learning tend to exhibit higher levels of grit and demonstrate greater persistence in their language learning endeavors (e.g., Lee & Taylor, 2022; Teimouri et al., 2022) [34, 43]. Moreover, existing literature highlights a positive correlation between L2 grit and learners' self-efficacy (e.g., Sun & Mu, 2023) [44]. Notably, L2 grit has been found to be positively associated with student satisfaction (Sun & Mu, 2023) [44], buoyancy (the capacity to navigate academic challenges and complexities; Alazemi et al., 2023a) [45], resilience (the ability to thrive in the face of adversity; Alazemi et al., 2023b) [46], language learning curiosity (Paradowski & Jelińska, 2023; Choi & Lee, 2023; Pawlak et al., 2022) [22, 28, 29], and peace of mind (a state of tranquility and serenity; Badiei et al., 2023) [47].

Beyond exploring the connections between positive psychology and L2 grit, researchers have also inquired into the interplay between language learners' grit personality and negative psychological factors, notably students' language learning anxiety. Research findings point to a negative relation between grit and anxiety (e.g., Teimouri et al., 2022; Zhao & Wang, 2023) [43, 48]. Besides, previous studies have shown a negative relationship between L2 grit and foreign language boredom (e.g., Pawlak et al., 2022) [29], burnout (e.g., Liu et al., 2021; Wu et al., 2023) [21, 49], and other negative emotions.

(2) *Grit and Language Mindsets*

Another construct that has been extensively explored in the reviewed literature is L2 learners' language mindsets, namely learners' beliefs about their language learning

abilities (Lou & Noels, 2017) [50]. According to Lou and Noels (2017) [50], two primary language mindsets are distinguished: the growth mindset and the fixed mindset. The growth mindset asserts that, regardless of initial language talent or age, language proficiency can be enhanced through sustained effort. Conversely, the fixed mindset holds that language aptitude is inherently innate and remains constant over the lifespan, impervious to individual attempts at improvement. The research results indicate that there is a significant positive relationship between overall L2 grit and growth mindset, but a significant negative relationship with fixed mindset both in traditional language classroom (e.g., Fathi *et al.*, 2024; Lee & Taylor, 2022; Teimouri *et al.*, 2022) [25, 34, 43] and in online foreign language learning (Paradowski & Jelińska, 2023) [22]. Several studies have examined the relationships between the components of L2 grit (i.e., POE and COI) and language mindsets. Specifically, research has shown that POE is significantly positively associated with growth mindset (e.g., Teimouri *et al.*, 2022; Khajavy *et al.*, 2021; Kırmızı *et al.*, 2023) [43, 51, 52]. However, the findings regarding the relationship between POE and fixed mindset, as well as the connection between COI and both language mindsets, have been inconclusive. For instance, Khajavy *et al.* (2021) [51] reported that COI was a significant negative predictor of fixed mindset and a non-significant positive predictor of growth mindset, while POE was a non-significant positive predictor of fixed mindset. Teimouri *et al.* (2022) [43] found that POE was significantly negatively correlated with fixed mindset, while COI showed insignificant correlations with both growth and fixed mindsets. Additionally, Kırmızı *et al.* (2023) [52] observed that fixed mindset was significantly positively associated with COI and negatively associated with POE, while growth mindset was significantly positively associated with POE and negatively associated with COI.

(3) *Grit and Motivational Variables*

Existing research has also scrutinized how motivational variables relate to grit in language learning. Among the different perspectives from which language learners' motivation could be approached are L2 Motivational Self System (L2MSS), L2 WTC, and goal orientations. This section reviews research on the relationship between grit and the four specific aspects.

Numerous studies have substantiated the relationship between L2MSS and grit. L2MSS is a potent and innovative motivational framework proposed by Dörnyei (2009)

[53]. This framework emphasizes the influence of three pivotal elements on learners' motivation and behavior during their language learning journey: ideal L2 self (learners' aspiration to achieve their desired ideal L2 proficiency in the future.), ought-to L2 self (attributes that a learner or others believe s/he should possess to avoid negative outcomes), and L2 learning experience. Among the studies investigating the relationship between L2MSS and grit, Kırmızı *et al.* (2023) [52] discovered that POE was significantly and positively correlated with ideal L2 self, and COI was significantly and negatively correlated with both ideal L2 self and ought-to L2 self/own. However, POE and COI did not show significant correlations with ought-to L2 self/others. Additionally, Fathi and Hejazi (2023) [54] confirmed the predicting effect of ideal L2 self on L2 grit.

There is also evidence of the connection between L2 grit and L2 WTC, the final mental step determining the learner's ability to engage in real communication before language use (Lee, 2022) [55]. For instance, Lee and Taylor (2022) [34] examined the L2 grit and WTC of 160 primary school students in Hong Kong SAR. Their findings revealed a significant and positive association between L2 grit and WTC both within and outside the classroom. Interestingly, the study indicated that grit was a stronger predictor of WTC outside the classroom compared to within. In a separate study conducted by Lee (2022) [55], 647 EFL learners across primary, secondary, and tertiary education levels in South Korean were investigated. This study produced nuanced results. Notably, it was observed that POE was positively and significantly correlated with L2 WTC across all three cohorts, with elementary students demonstrating the highest effect size and tertiary students the lowest. Furthermore, COI showed a significant positive correlation with L2 WTC only in elementary students. Additionally, POE was a significant positive predictor of L2 WTC, with the strongest effect observed in elementary students. However, COI did not show a significant predictive relationship with L2 WTC across all educational levels.

Furthermore, research has shown a close connection between the goals of language learners and their level of grit. For example, a study by Khajavy and Aghaee (2022) [56] focused on the relationship between the grit levels of Iranian EFL learners and their personal best goals—ambitious objectives that individuals set out to achieve to surpass their own previous performance standards (Burns *et al.*, 2018) [57]. The findings revealed that

only POE significantly influenced personal best goals. Interestingly, personal best goals were recognized as a key mediator in the association between POE and L2 achievement. In another study conducted by Zhang (2022) [58] in the Chinese mainland, the interaction between achievement goals and grit among tertiary EFL learners was investigated. The results demonstrated that mastery goals and performance-approach goals had positive impacts on POE, while performance-avoidance goals had significant negative effects on both facets of L2 grit.

3.3.5 Grit and Learner-external Variables

In addition to learner-internal factors, external factors, such as the classroom environment, significant others (e.g., teachers and peers), academic engagement, task difficulty, and complexity, are also closely intertwined with L2 grit. In a study by Wei et al. (2019) [59], it was highlighted that the L2 classroom environment significantly influenced the correlation between L2 grit and foreign language enjoyment, as well as the relationship between L2 grit and learning performance. It was observed that in a positive classroom environment, students exhibiting grit were more likely to be fully engrossed in their studies and to achieve superior learning outcomes in the foreign language. Conversely, it was found that in a negative classroom environment, even if students possessed the willingness to persist in their studies, external distractions could impede their progress and prevent them from achieving their expected goals.

The impact of various factors related to social relationships, such as teacher care, support, and stroke, teacher enjoyment, and teacher-student rapport, on the enhancement of the L2 learners' grit personality has been observed to be positive, which consequently augments their learning outcomes (e.g., Wu et al., 2023; Banse & Palacio, 2018; Yuan, 2022) [49, 60, 61]. In addition, the presence of peer support is also shown to be instrumental in boosting learners' grit levels. For example, Cui and Yang (2022) [40] conducted a year-long study on 2435 Chinese secondary school English learners to investigate the relationship between L2 grit and social interactions. They observed that at Time 1, peer relationships positively predicted grit levels at Time 2, while teacher-student and peer relationships at Time 2 positively predicted grit levels at Time 3. Furthermore, they found that grit levels at Time 1 positively predicted teacher-student and peer relationships at Time 2, and grit levels at Time 2 positively predicted teacher-student and peer relationships at Time 3.

Furthermore, there is strong evidence that L2 grit can positively impact learners' academic engagement. For instance, a study by Derakhshan and Fathi (2023) [20] found that L2 grit positively predicted the engagement of EFL learners in online learning. Similarly, Sadoughi and Hejazi (2023) [62] discovered that L2 grit served as a mediator in the relationship between perceived teacher support and academic engagement, and in the relationship between growth mindset and academic engagement. Learners receiving greater teacher support and endorsing higher levels of growth mindset were able to effectively navigate challenges and maintain interest, thereby demonstrating a greater level of perseverance in handling failures and difficulties, and significantly enhancing their engagement in learning.

Additionally, studies have explored the correlation between perceived task complexity and difficulty and L2 grit. Chou (2023) [63] established that the perceived complexity of a task partially mediated the relationship between L2 grit and students' learning approaches. Similarly, Zhang and Zhang (2023) [64] demonstrated that the complexity of L2 writing tasks significantly moderated the impact of grammar inferring abilities and working memory on L2 writing skills.

4 Summary and Suggestions for Future Research

As the above review shows, the exploration of grit in L2 research has seen a notable increase in recent years, with a range of topics being examined and some encouraging progress being made. However, this field of research is fraught with several limitations and areas of potential improvement. Firstly, existing studies have largely concentrated on EFL learners within the Iranian and Chinese EFL contexts, disregarding learners from other countries or regions and limiting the concept of L2 grit to "grit in English language learning". Furthermore, there is significant variation in sample sizes across studies, with some having small sample sizes that might limit the generalizability of research findings. Secondly, the majority of studies have utilized quantitative research designs, distributing quantitative questionnaires to collect data and analyzing variable levels and relationships using statistical software like SPSS or Mplus, or establishing structural equation models among different variables to reveal their interrelationships. While quantitative research can uncov-

er trends within groups, it falls short in uncovering individual differences comprehensively, indicating a lack of depth in the studies. Thirdly, in research design, most studies have utilized cross-sectional designs, yet the essence of grit entails persistent effort and consistent interest. Given this, cross-sectional designs are incongruous with the nature of grit, highlighting the need for longitudinal research designs, which are currently underutilized and not conducted for extended durations. Thirdly, some studies have still adopted the domain-general grit scale to quantify L2 learners' grit levels, which is deemed unreasonable. Most studies have adapted the two-dimensional L2 grit scale developed by Teimouri *et al.* (2020) [10]. However, it is worth noting that the essence of grit may vary across different cultures, leading to potential biases when measuring grit among learners from diverse cultural backgrounds. Furthermore, using the same scale to measure grit levels among learners at different educational levels (e.g., elementary, secondary, and tertiary students) is not advisable as cognitive abilities and questionnaire comprehension may vary among these groups, undermining the accuracy of survey results. Additionally, in terms of the research contents, only a few studies have explored the cultivation of grit through quasi-experimental designs while lacking detailed processes for training or regulating learners' grit. Finally, extant research has mainly delved into micro-level factors like L2 grit's connection to L2 learning achievements and learners' internal and external aspects. There is a scarcity of studies investigating the macro-level social, economic, and cultural factors that might potentially shape L2 learners' grit personality.

Based on the analysis above, future studies should firstly diversify research subjects to encompass language learners from various regions and countries or conduct comparative analyses of multilingual learners' grit. Enlarging the sample size would improve the generalizability of research findings. Secondly, research methods should be diversified beyond quantitative approaches, incorporating qualitative methods or utilizing mixed-methods research for a more comprehensive and in-depth understanding of L2 learners' grit quality. Longitudinal research designs should be adopted more frequently to reveal the dynamic changes in learners' grit levels during their L2 learning processes and to unveil their individual differences. Thirdly, researchers need to develop tools that align with local cultures to measure grit levels accurately and apply additional research tools like interviews and reflective journals to triangulate quantitative results. Fourthly, emphasis should be placed on

fostering learners' L2 grit quality through well-structured training steps. Lastly, investigating the macro factors influencing L2 grit, such as societal, economic, and cultural influences, is crucial.

5 Conclusion

This article reviewed the existing empirical studies related to L2 grit indexed in the Web of Science database, examining the prevailing trends, research subjects, research methodologies, and a diverse array of research topics within this discipline. Several significant findings have emerged from this study. Primarily, the trajectory of L2 grit is expected to trend upward. The results also revealed significant diversity among study participants, reflecting variations in academic status and cultural backgrounds. Moreover, it was observed that quantitative research methodologies were predominantly utilized in this field of investigation. Furthermore, the reviewed studies focused on key themes such as scale development and validation, the influence of L2 grit on academic achievement, the dynamics of L2 grit, and the interaction between L2 grit and internal and external learner factors.

Based on the review of the empirical investigations in the field of L2 grit, this article identified the shortcomings in current research. To address these limitations and advance research on L2 grit, the article suggests that future research should expand the subject populations, increase the sample size, innovate the research methods, design suitable research instruments for L2 learners across diverse cultures, and enrich research contents.

References

- [1] Rivera, A. R., Gálvez-Mozo, A. & F. Tirado-Serrano. The imperative of happiness in positive psychology: Towards a psychopolitics of wellbeing [J]. *New Ideas in Psychology*. 2024, 72: 101058.
- [2] Sheldon, K. M. & L. King. Why positive psychology is necessary [J]. *American Psychologist*. 2001, 56(3): 216.
- [3] Seligman, M. E. Building human strength: Psychology's forgotten mission [J]. *APA Monitor*. 1998, 29(1): 1-6.
- [4] Chamorro-Premuzic, T. & A. Furnham. Mainly Openness: The relationship between the Big Five personality traits and learning approaches [J]. *Learning and Individual Differences*. 2009, 19(4): 524-529.

- [5] Hong, J. C., Cao, W., Liu, X., Tai, K. H. & L. Zhao. Personality traits predict the effects of Internet and academic self-efficacy on practical performance anxiety in online learning under the COVID-19 lockdown [J]. *Journal of Research on Technology in Education*. 2023, 55(3): 426-440.
- [6] Stoffel, J. M. & J. Cain. Review of grit and resilience literature within health professions education [J]. *American Journal of Pharmaceutical Education*. 2018, 82(2): 61-50.
- [7] Duckworth, A. L., Peterson, C., Matthews, M. D. & D. R. Kelly. Grit: perseverance and passion for long-term goals [J]. *Journal of Personality and Social Psychology*. 2007, 92(6): 1087-1101.
- [8] O'Neal, C. R., Boyars, M. Y. & L. W. Riley. Dual language learners' grit, engagement, and literacy achievement in elementary school [J]. *School Psychology International*. 2019, 40(6): 598-623.
- [9] Gyamfi, G. & Y. Lai. Beyond Motivation: Investigating Thai English Major Students' Grit [J]. *PASAA: Journal of Language Teaching and Learning in Thailand*. 2020, 60: 60-96.
- [10] Teimouri, Y., Plonsky, L. & F. Tabandeh. L2 grit: Passion and perseverance for second-language learning [J]. *Language Teaching Research*. 2020, 26(5): 893-918.
- [11] Sudina, E., Vernon, T., Foster, H., Del Villano, H., Hernandez, S., Beck, D. & L. Plonsky. Development and initial validation of the L2-Teacher Grit Scale [J]. *Tesol Quarterly*. 2021a, 55(1): 156-184.
- [12] Wei, R., Liu, H. & S. Wang. (2020). Exploring L2 grit in the Chinese EFL context [J]. *System*. 2020, 93: 102295.
- [13] Wang, Y. & W. Ren. L2 grit and pragmatic comprehension among Chinese postgraduate learners: Enjoyment and anxiety as mediators [J]. *International Journal of Applied Linguistics*. 2024, 34(1): 224-241.
- [14] Wang, R., Shirvan, M. E. & T. Taherian. Perseverance of effort and consistency of interest: A longitudinal perspective [J]. *Frontiers in Psychology*. 2021, 12: 743414.
- [15] Zhao, X., Sun, P. P. & M. Gong. The merit of grit and emotions in L2 Chinese online language achievement: a case of Arabian students [J]. *International Journal of Multilingualism*. 2023: 1-27.
- [16] Li, C. & Y. Yang. Domain-general grit and domain-specific grit: Conceptual structures, measurement, and associations with the achievement of German as a foreign language [J]. *International Review of Applied Linguistics in Language Teaching*. 2023. <https://doi.org/10.1515/iral-2022-0196>
- [17] Sudina, E. & L. Plonsky. The effects of frequency, duration, and intensity on L2 learning through Duolingo: A natural experiment [J]. *Journal of Second Language Studies*. 2023, 7(1): 1-43.
- [18] Yang, S., Azari Noughabi, M. & S. Jahedizadeh. Modelling the contribution of English language learners' academic buoyancy and self-efficacy to L2 grit: evidence from Iran and China [J]. *Journal of Multilingual and Multicultural Development*. 2022: 1-17.
- [19] Sudina, E., Brown, J., Datzman, B., Oki, Y., Song, K., Cavanaugh, R. & L. Plonsky. Language-specific grit: Exploring psychometric properties, predictive validity, and differences across contexts [J]. *Innovation in Language Learning and Teaching*. 2021b, 15(4): 334-351.
- [20] Derakhshan, A. & J. Fathi. Grit and foreign language enjoyment as predictors of EFL learners' online engagement: The mediating role of online learning self-efficacy [J]. *The Asia-Pacific Education Researcher*. 2023: 1-11.
- [21] Liu, C., He, J., Ding, C., Fan, X., Hwang, G. J. & Y. Zhang. Self-oriented learning perfectionism and English learning burnout among EFL learners using mobile applications: The mediating roles of English learning anxiety and grit [J]. *Learning and Individual Differences*. 2021, 88, 102011.
- [22] Paradowski, M. B. & M. Jelińska. The predictors of L2 grit and their complex interactions in online foreign language learning: motivation, self-directed learning, autonomy, curiosity, and language mindsets [J]. *Computer Assisted Language Learning*. 2023: 1-38.
- [23] Li, C., Jiang, G. & J.-M. Dewaele. Understanding Chinese high school students' foreign language enjoyment: Validation of the Chinese version of the foreign language enjoyment scale [J]. *System*. 2018, 76: 183-196.
- [24] Dewaele, J.-M. & P. MacIntyre. The two faces of Janus? Anxiety and enjoyment in the foreign language classroom [J]. *Studies in Second Language Learning and Teaching*. 2014, 4(2): 237-274.
- [25] Fathi, J., Pawlak, M., Saeedian, S. & A. Ghaderi. Exploring factors affecting foreign language achievement: The role of growth mindset, self-efficacy, and L2 grit [J]. *Language Teaching Research*. 2024: 13621688241227603.
- [26] Hejazi, S. Y. & M. Sadoughi. How does teacher support contribute to learners' grit? The role of learning enjoyment [J]. *Innovation in Language Learning and Teaching*. 2023, 17(3): 593-606.
- [27] Shirvan, M. E., Taherian, T., Shahnama, M. & E. Yazdanmehr. A longitudinal study of foreign language enjoyment and L2 grit: A latent growth curve modeling [J]. *Frontiers in Psychology*. 2021, 12: 720326.
- [28] Choi, E. Y. & J. H. Lee. An exploratory study on the relationships between positive emotions and target language vocabulary knowledge [J]. *Oxford Review of Education*. 2023: 1-16.

- [29] Pawlak, M., Csizr, K., Kruk, M. & J. Zawodniak. Investigating grit in second language learning: The role of individual difference factors and background variables [J]. *Language Teaching Research*. 2022; 13621688221105775.
- [30] Khodaverdian Dehkordi, M., Jabbari, A. A. & G. Mazdayasna. Examining the Association of Grit Profiles With Big Five Personality and Achievement Among Iranian Foreign Language Learners [J]. *Frontiers in Psychology*. 2021, 12: 801844.
- [31] Lee, J. S. & Q. Xie. Profiling the affective characteristics of EFL learners' digital informal learning: A person-centered approach [J]. *Innovation in Language Learning and Teaching*. 2023, 17(3): 552-566.
- [32] Ghafouri, M. ChatGPT: The catalyst for teacher-student rapport and grit development in L2 class [J]. *System*. 2024, 120: 103209.
- [33] Wang, K. Grammar enhancement in EFL instruction: a reflection on the effects of self-evaluation, teacher support, and L2 grit [J]. *BMC Psychology*. 2024, 12(1): 15.
- [34] Lee, J. S. & T. Taylor. Positive psychology constructs and extramural English as predictors of primary school students' willingness to communicate [J]. *Journal of Multilingual and Multicultural Development*. 2022: 1-19.
- [35] Chen Hsieh, J. & J. S. Lee. Digital storytelling outcomes, emotions, grit, and perceptions among EFL middle school learners: Robot-assisted versus PowerPoint-assisted presentations [J]. *Computer Assisted Language Learning*. 2023, 36(5-6): 1088-1115.
- [36] Ebadi, S., Weisi, H. & Z. Khaksar. Developing an Iranian ELT context-specific grit instrument [J]. *Journal of Psycholinguistic Research*. 2018, 47: 975-997.
- [37] Mikami, H. Revalidation of the L2-Grit scale: A conceptual replication of Teimouri, Y., Plonsky, L., & Tabandeh, F. (2022). L2 grit: Passion and perseverance for second-language learning [J]. *Language Teaching*. 2023: 1-16.
- [38] Shirvan, M. E., Taherian, T. & E. Yazdanmehr. L2 grit: a longitudinal confirmatory factor analysis-curve of factors model [J]. *Studies in Second Language Acquisition*. 2022, 44(5): 1449-1476.
- [39] Alamer, A. Grit and language learning: construct validation of L2-Grit scale and its relation to later vocabulary knowledge [J]. *Educational Psychology*. 2021, 41(5): 544-562.
- [40] Cui, T. & Y. Yang. Social relationships and grit in English as a foreign language learning among high school students: A three-wave longitudinal study [J]. *Frontiers in Psychology*. 2022, 13: 1038878.
- [41] Calafato, R. The moderating effect of multilingualism on the relationship between EFL learners' grit, enjoyment, and literacy achievement [J]. *International Journal of Bilingualism*. 2024: 13670069231225729.
- [42] Shehzad, M. W., Hasan, M. K., Ahmed, R., Razzaq, S. & S. Ahmed. The nexus between grit and pronunciation performance among EFL learners: the mediating role of pronunciation self-efficacy beliefs [J]. *Learning and Teaching in Higher Education: Gulf Perspectives*. 2022, 18(1): 32-48.
- [43] Teimouri, Y., Tabandeh, F. & S. Tahmouresi. The hare and the tortoise: The race on the course of L2 learning [J]. *The Modern Language Journal*. 2022, 106(4): 764-783.
- [44] Sun, Z. & B. Mu. Motivating online language learning: exploring ideal L2 self, grit, and self-efficacy in relation to student satisfaction [J]. *Frontiers in Psychology*. 2022, 14: 1293242.
- [45] Alazemi, A. F. T., Heydarnejad, T., Ismail, S. M. & A. Gheisari. A model of academic buoyancy, L2 grit, academic emotion regulation, and personal best: An evidence from EFL context [J]. *Heliyon*. 2023a, 9(2). <https://doi.org/10.1016/j.heliyon.2023.e13149>
- [46] Alazemi, A. F. T., Jember, B. & A. H. Al-Rashidi. How to decrease test anxiety: A focus on academic emotion regulation, L2 grit, resilience, and self-assessment [J]. *Language Testing in Asia*. 2023b, 13(1): 28.
- [47] Badiei, G., Noughabi, M. A. & S. K. Amirian. Foreign language peace of mind, foreign language enjoyment, and perceived language proficiency: The mediating role of L2 grit [J]. *English Teaching & Learning*. 2023: 1-18.
- [48] Zhao, X. & D. Wang. Domain-Specific L2 Grit, Anxiety, Boredom, and Enjoyment in Online Chinese Learning [J]. *The Asia-Pacific Education Researcher*. 2023: 1-12.
- [49] Wu, W., Wang, Y. & R. Huang. Teachers matter: exploring the impact of perceived teacher affective support and teacher enjoyment on L2 learner grit and burnout [J]. *System*. 2023, 117: 103096.
- [50] Lou, N. M. & K. A. Noels. Measuring language mindsets and modeling their relations with goal orientations and emotional and behavioral responses in failure situations [J]. *The Modern Language Journal*. 2017. 101(1): 214-243.
- [51] Khajavy, G. H., MacIntyre, P. D. & J. Hariri. A closer look at grit and language mindset as predictors of foreign language achievement [J]. *Studies in Second Language Acquisition*. 2021, 43(2): 379-402.
- [52] Kırımı, ., Irgatođlu, A. & E. H. Atalımsı. Examining the Interplay Between Growth and Fixed Mindsets, L2 Grit, and L2 Motivational Self-System of L2 Learners [J]. *SAGE Open*. 2023, 13(4): 21582440231208997.

- [53] Dörnyei, Z. The L2 motivational self system [J]. *Motivation, Language Identity and the L2 Self*. 2009, 36(3): 9-11.
- [54] Fathi, J. & S. Y. Hejazi. Ideal L2 self and foreign language achievement: The mediating roles of L2 grit and foreign language enjoyment [J]. *Current Psychology*. 2023: 1-15.
- [55] Lee, J. S. The role of grit and classroom enjoyment in EFL learners' willingness to communicate [J]. *Journal of Multilingual and Multicultural Development*. 2022, 43(5): 452-468.
- [56] Khajavy, G. H. & E. Aghaee. The contribution of grit, emotions and personal bests to foreign language learning [J]. *Journal of Multilingual and Multicultural Development*. 2022: 1-15.
- [57] Burns, E. C., Martin, A. J. & R. J. Collie. Adaptability, personal best (PB) goals setting, and gains in students' academic outcomes: A longitudinal examination from a social cognitive perspective [J]. *Contemporary Educational Psychology*. 2018, 53: 57-72.
- [58] Zhang, J. Modelling the interplay of writing achievement goals and grit in predicting L2 writing achievements [J]. *System*. 2023, 117: 103118.
- [59] Wei, H., Gao, K. & W. Wang. Understanding the relationship between grit and foreign language performance among middle school students: The roles of foreign language enjoyment and classroom environment [J]. *Frontiers in Psychology*. 2019, 10: 462549.
- [60] Banse, H. & N. Palacios. Supportive classrooms for Latino English language learners: Grit, ELL status, and the classroom context [J]. *The Journal of Educational Research*, 2018, 111(6): 645-656.
- [61] Yuan, L. Enhancing Chinese EFL Students' Grit: The Impact of Teacher Stroke and Teacher-Student Rapport [J]. *Frontiers in Psychology*. 2022, 12: 823280.
- [62] Sadoughi, M. & S. Y. Hejazi. Teacher support, growth language mindset, and academic engagement: The mediating role of L2 grit [J]. *Studies in Educational Evaluation*. 2023, 77: 101251.
- [63] Chou, M. H. Examining the influence of L2 grit and English proficiency on learning approaches: a mediation analysis through expectancy of success and perceived task difficulty [J]. *Educational Psychology*. 2023, 43(9): 1102-1123.
- [64] Zhang, J. & L. J. Zhang. Examining the relationship between English as a foreign language learners' cognitive abilities and L2 grit in predicting their writing performance [J]. *Learning and Instruction*. 2023, 88: 101808.